

Remarks

Applicant notes with appreciation to the courtesy and professionalism of both of the Examiners present at the recent office interview.

At the interview and as set forth in the Interview Summary (Paper No. 06162005) Applicant, through its undersigned counsel, offered Claim 11 (as amended herein) for discussion.

In the office action mailed March 11, 2005 (Paper No./Mail Date 02162005) the Examiner argued that Claim 11 as filed was obvious in view of the combination of Powell '194, Nishiguchi (J. Crystal Growth) and Inoguchi '647.

The claimed invention specifically produces etch pits (in the selective etching step) prior to epitaxial growth as a means of encouraging basal plane dislocations—which are troublesome under forward voltage conditions—to propagate during epitaxial growth into fewer and less troublesome threading dislocations.

Powell '194 seeks to grow 3C silicon carbide (SiC) on 6H silicon carbide substrates by promoting “2D” (two-dimensional) growth on “atomically-flat” (e.g. Column 1, lines 25-27) surfaces. See also Powell’s summary at Columns 7, lines 20-34. Accordingly, Powell continually emphasizes the use of smooth silicon carbide surfaces. Powell refers to these as: “atomically flat” (Column 1, line 26); “totally without any atomic-scale or micro-scale steps” (Column 2, lines 39-40); “nearly atomically flat” (Column 7, line 25); “properly prepared” (Column 8, line 50); having “minimized” line defects (Column 9, lines 2-4); and as avoiding, “rough surface morphology or pits on the substrate” (Column 12, lines 9-10). In actual practice, Powell '194 specifically avoids sublimation-grown crystals in order to avoid, “micropipes and dislocations” (Column 14, lines 13-16).

Therefore, Applicant respectfully submits that Powell '194 is inconsistent with—and teaches away from—any technique that uses or encourages etch pits.

The Nishiguchi reference is thus inconsistent with Powell '194. Nishiguchi specifically creates and observes etch pits on a silicon carbide surface because—as stated by

Nishiguchi and recognized in this art—etch pit structures offer information about the growth mechanism because etching is “contrary” (Nishiguchi’s term) to growth (page 237, right hand column). Stated differently, structures that appear following etching are helpful in identifying growth mechanisms. Accordingly, no reason exists (other than the pending claims) in either Powell ‘194 or Nishiguchi to incorporate Nishiguchi’s pits into or with Powell’s flat surfaces, or vice versa. Noguchi fails to disclose or suggest anything else that would encourage the skilled person to combine it in the manner of the Examiner, particularly given Powell’s emphasis on smooth surfaces.

Therefore, because Powell ‘194 and Nishiguchi standing alone teach in opposite directions, no logical reason exists for the skilled person to combine them. As a result, the combination of Powell and Nishiguchi must collapse.

Inoguchi ‘647 has been cited for its growth of a thick epitaxial layer as one technique for reducing defect concentration; e.g., the March 11, 2005 office action at page 5, Paragraph 8. Inoguchi thus offers neither any logical bridge between Powell ‘194 and Nishiguchi nor any cure to the mutually contradictory goals of Powell and Nishiguchi.

In order to further clarify the case and simplify the issues under consideration, independent Claim 11 has been amended to include certain of the recitations of Claim 1, and Claims 1-3 and 5 have been canceled.

Although Claim 24 was not specifically discussed at the interview, Applicant submits that the issues are substantially the same as those raised and addressed with respect to Claim 11 and that Claim 24 is allowable over the art as applied to date for the same reasons as is Claim 11.

All of the remaining claims are dependent from either Claim 11 or Claim 24 and Applicant submits that they are likewise allowable.

The other objections to the application have been addressed as follows:

Based on the Examiner's objection to the drawings, a replacement sheet of Figures 2 and 3 is included herewith. This is included as a separate sheet and, for confirmation purposes, is reproduced herein:

Replacement Sheet

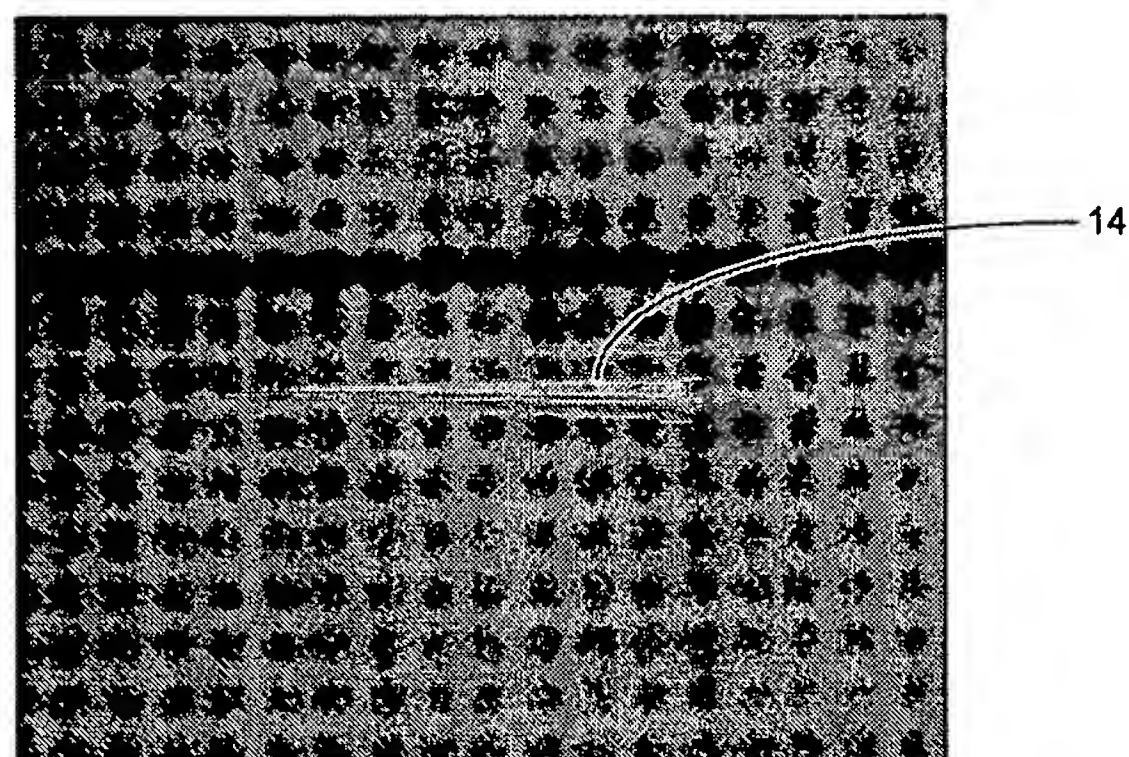


Figure 2

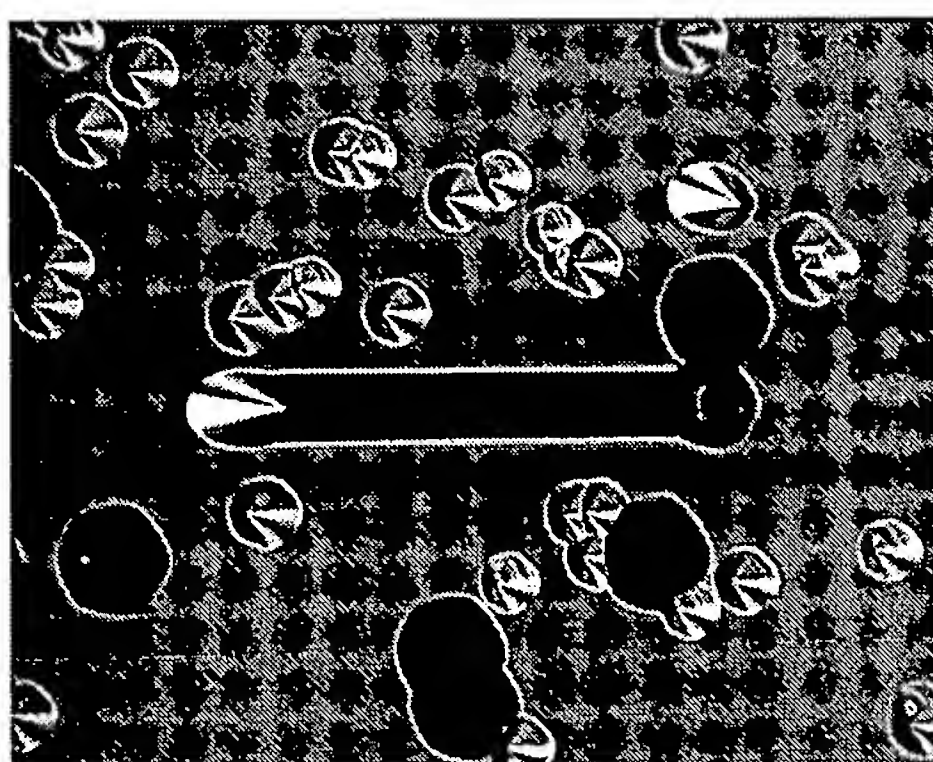


Figure 3

of

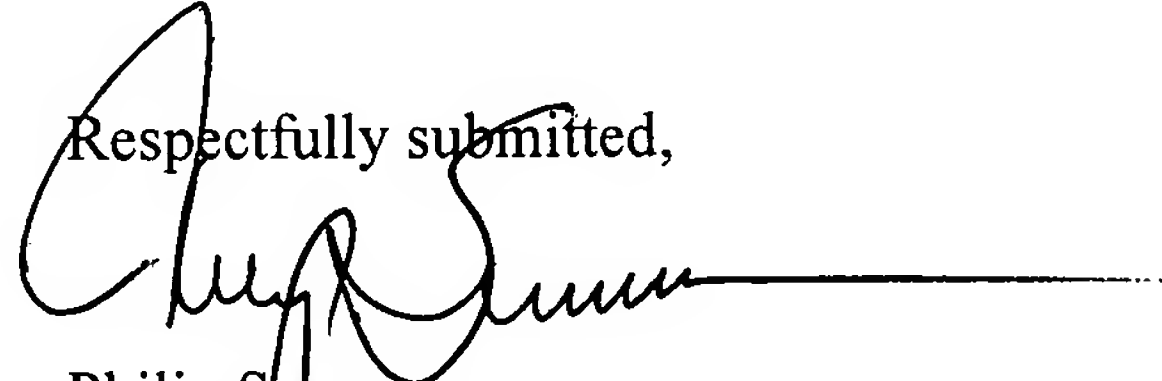
The Examiner also objected to the language of Claim 2, but because Claim 2 has been canceled, this objection is now moot.



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Applicant accordingly submits that all of the rejections and objections raised against the application have been properly addressed and that the application is in condition for immediate allowance.

Respectfully submitted,

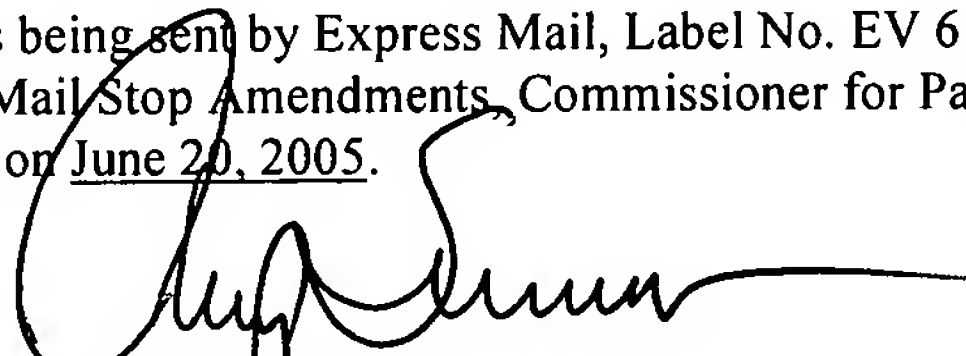


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